Thus by using the data shown in the table and by the application of the Newton's method (Phys. Rev. **78**, 490(1950)) we could derive the accurate value of the half life of ThC′ as

$$\tau = 2.9 \times 10^{-7} \text{ sec.}$$

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2. The (γ, n) Reaction of Silver Produced by the Li–p γ–Rays

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The (γ, n) reaction of silver produced by the irradiation of Li–p γ–rays was observed. The metallic lithium target was bombarded by the proton beam of 460 Kv separated by a magnet. The number of γ–ray quanta was counted by a G–M counter with a lead wall of 6.5 mm in thickness. The silver samples of 218 mg/cm^2 and 110 mg/cm^2 in thickness, 21 mm in diameter were used. We used also similar silver monitors. For the measurement of β–activities induced in these samples and the monitors, we used two G–M counters of 2π–type, each of which had a mica window of about 3 mg/cm^2 in thickness and 24 mm in diameter.

In the present experiment, the sample and the monitor were irradiated for five minutes, and after half a minute their activities were counted for twenty minutes.

The silver has two isotopes Ag^{107} and Ag^{109}. The observed reactions were as follows:

$$Ag^{107}(\gamma, n)Ag^{106} \text{ and } Ag^{109}(\gamma, n)Ag^{108}.$$

The obtained half–lives were 25.46 min. and 2.36 min. for Ag^{106} and Ag^{108} respectively. And other lives were not observed.

In order to obtain the cross–section of the reaction, we considered the following correction factors: 1) geometrical factor of the counter, 2) β–ray absorption by the mica window, 3) solid angle subtended by the sample at the target and 4) self–absorption and self–backscattering in the samples. These were determined experimentally. Especially, in order to eliminate the self–absorption and self–backscattering effect in the samples, we used samples varied in thickness but equal in diameter. The thickness of the thinnest sample was 12 mg/cm^2. After plotting the curve of specific activity vs. thickness of sample, we extrapolated the curve to zero thickness. In this complementary experiment, the active silver samples irradiated by slow neutrons were used. Therefore, strictly speaking, this correction could be applied to Ag^{108} only.

The cross-sections obtained were as follows:

$1.86\times10^{-26}cm^2$ for $Ag^{109}(\gamma\ n)Ag^{108}$

$1.68\times10^{-26}cm^2$ ror $Ag^{107}(\gamma.\ n)Ag^{106}$.

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3. Accelerating Tube for Neutron Production

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The accelerating tube for neutron production have recently been improved and reconstructed.

The main points of the improvements and the constructions of the tube were as follows.

1. Ion source.

A new type magnetic ion source without hot cathode was applied. The discharge was produced ın a small cylındrical space which was formed by a pair of iron cathodes and an anode of annular shape. The necessary magnet c field of about 400 gauss was made between those cathodes and the discharging voltage was 2000 volts. The stable deuterium ion beam of about $190\mu A$ was introduced to the accelerating portion of the tube through a canal of 3 mm. in diameter and 7 mm. in length. The electric powers consumed by the ion source were about 70 watts for the magnetic field and 20 watts for the discharge.

2. Accelerating electrodes.

The cylindrical electrodes of three stages, each of which had a bottom with an edgeless hole of 2 cm. in diameter, were set coaxially and comparatively close to each other for the purpose of shortening the ion path as possıble. The distance between the ion source and the first electrode was 9.5 cm. and the distances between each accelerating electrode were 5.5 cm. The electrıc fiield formed by the holes converged the ion beam. Therefore the ions which issued from the ion source were accelerated to the energy of several hundreds kilovolts when passing through about 25 cm. in length and 70 to 80 percent of the ions would bombard the target.

3. Vacuum system.

We have preliminary measured the relations between the heater inputs and the pumping speed of the diffusion pump for the case of deuterium gas. The maximum pumping speed was found to be about 130 litre / sec at 800 watt heater input. By these experiments we examined quantitatively the size of the evacuating pipes and the gas leak quantity. Therefore, during the experiments, the accelerating tube was maintained at the vacuum pressure of